

# KORG



## MONOPHONIC SYNTHESIZER SERVICE MANUAL **MS-10**







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KEIO ELECTRONIC LABORATORY CORPORATION  
TOKYO/JAPAN

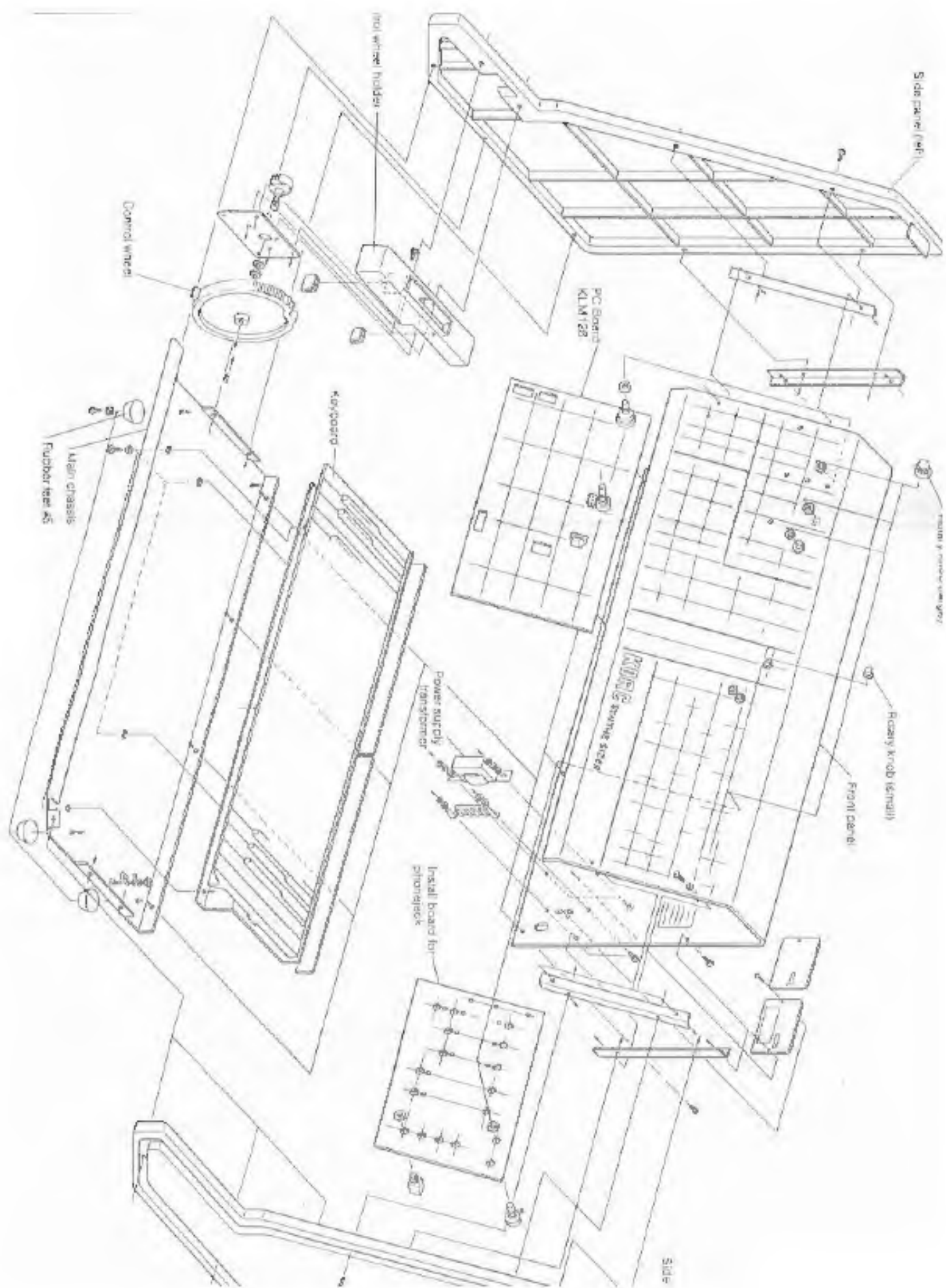
# 1. SPECIFICATIONS

## < CONTROL SECTION >

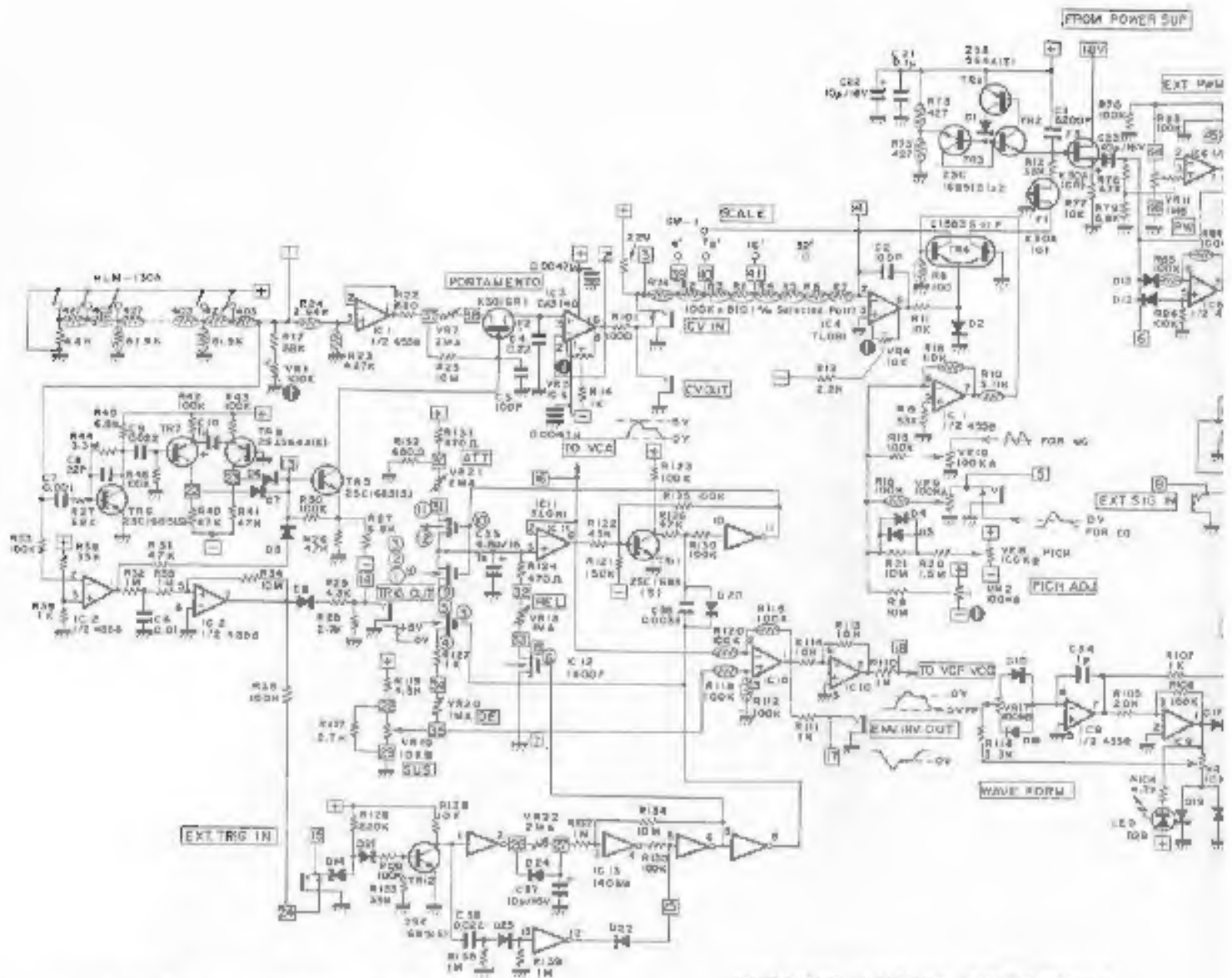
1. Keyboard \*F~C 32 Keys/(2-2/3 octaves)
2. Voltage controlled oscillator \*Scales (32', 16', 8', 4', 1' / + 6 octaves (FM))  
 \*Wave form: , , PW/PWM, Noise)/(4 modes)  
 \*PW adjust/PWM intensity  
 \*Pitch (1 OCTAVE OR MORE)  
 \*portamento  
 \*Frequency modulation intensity by MG  
 \*Frequency modulation intensity by EG/EXT
3. Voltage controlled low pass filter \*Cut-off frequency  
 \*Peak (flat ~ self OSC)  
 \*Cut-off frequency modulation intensity by MG  
 \*Cut-off frequency modulation intensity by EG/EXT
4. Envelope generator \*Hold time  
 \*Attack time  
 \*Decay time  
 \*Sustain level  
 \*Release time
5. Modulation generator \*Wave form , , ,  CONTINUALLY  
 \*Frequency
6. External input \*Signal level adjust
7. Manual controller \*Control wheel CENTER CLICK STOP
8. Power SW A volume \*Volume

## < PATCH PANEL SECTION >

1. Keyboard \*Keyboard control voltage output (exponential)/0V~+8V  
 \*Keyboard trigger output/  GND
  2. VCO \*VCO control voltage input (linear response)/0V~+8V  
 \*External frequency control input (OGT/V)/-3V~+3V  
 \*External pulse width modulation input/-5V~+5V
  3. VCF \*External signal input/3VPP max.  
 \*External cut-off frequency control input (2OCT/V)/-5V~+5V
  4. VCA \*Initial gain control input/0V~+5V
  5. EG \*External trigger input/  GND  
 \*Envelope signal reverse output/-5V~+5V
  6. MG \*Triangle output () / 5VPP  
 \*Rectangle output () / 0~+5V
  7. Noise generator \*Pink noise output/5VPP  
 \*White noise output/5VPP
  8. Manual controller \*Control wheel output/-5V~0V~+5V
  9. Signal out \*Signal output/2VPP max. (output impedance 3.5kΩ)
  10. Power consumption \* 5 Watts
- \*Dimension \*499(W) x 309(D) x 249(H) mm  
 \*Weight \*6.3 kgs  
 \*Accessories \*Patch cord/35 cm x 1

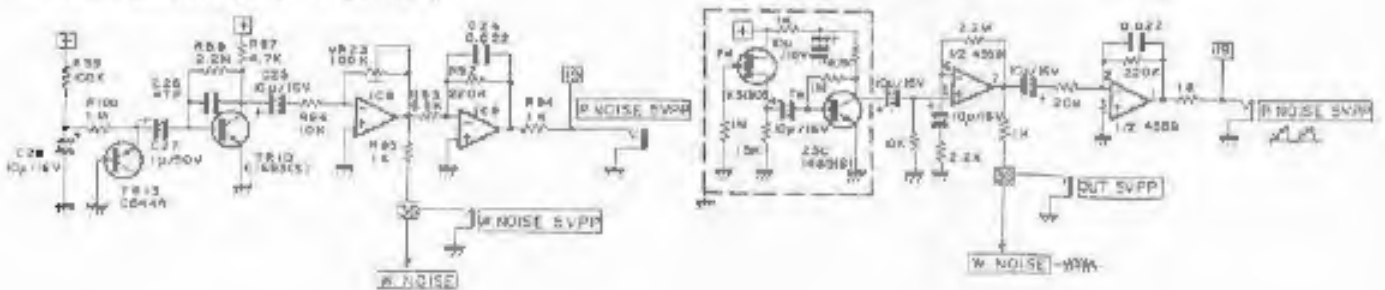


### 3. CIRCUIT DIAGRAM



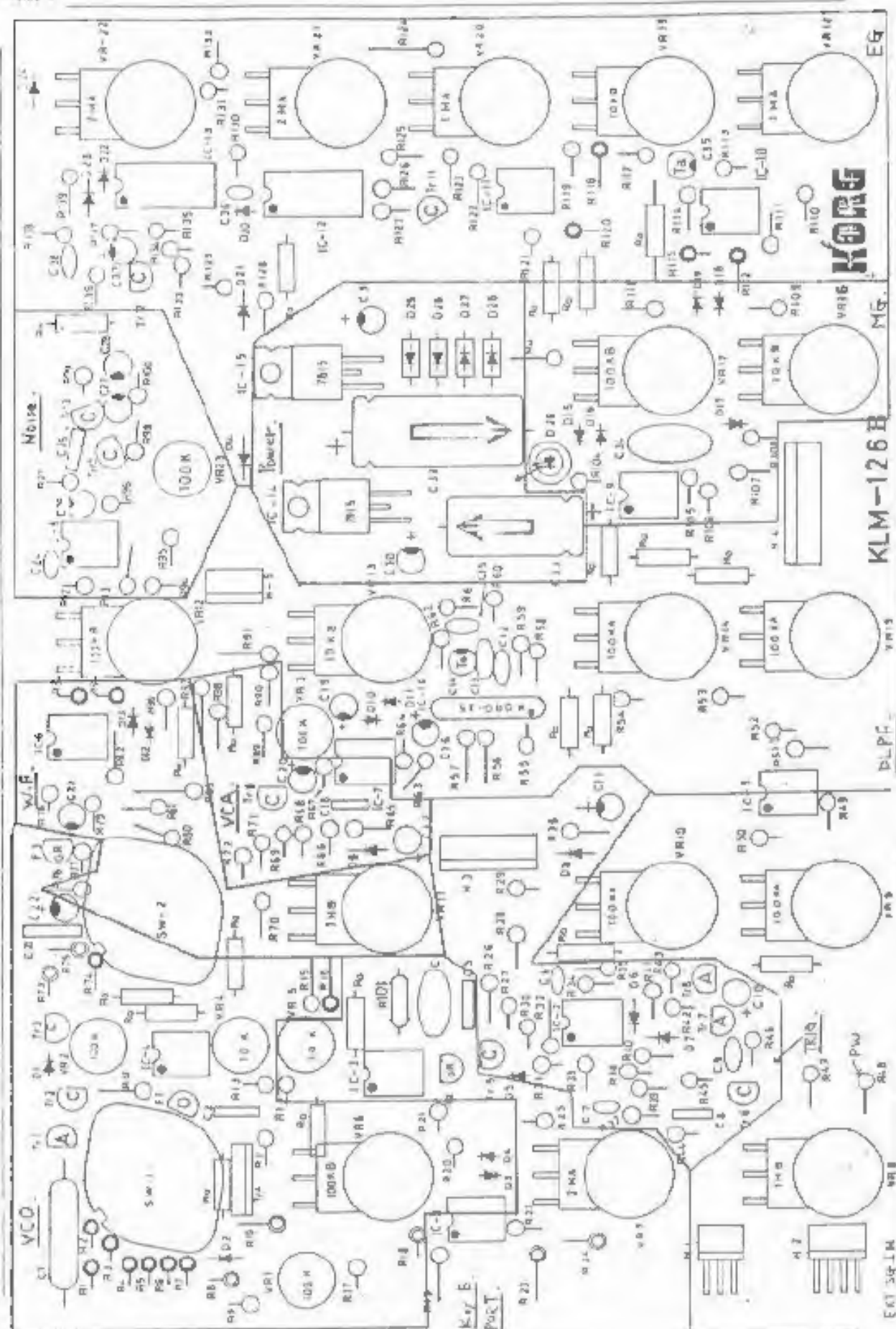
NOISE CIRCUIT NO. 2 (SERIAL NO. 132B28 ~ )

NOISE CIRCUIT NO. 1 (SERIAL NO. 13000 ~ 132B27)





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## 5. PARTS LIST

(Mechanical parts not listed)

### ● CARBON RESISTORS not listed

### ● METAL FILM RESISTORS

1/4W-100Ω	x	1
1/4W-403Ω	x	16
1/4W-427Ω	x	16
1/4W-2.94kΩ	x	1
1/4W-4.27kΩ	x	1
1/4W-5.11kΩ	x	1
1/4W-81.9kΩ	x	15
1/4W-100kΩ	x	15
1/4W-110kΩ	x	1

### ● MYLAR CAPACITORS

50V-0.001μF	x	3
50V-0.0033μF	x	2
50V-0.01μF	x	1
50V-0.022μF	x	3

### ● TANTALUM CAPACITORS

16V-6.8μF	x	1
16V-10μF	x	1

### ● CERAMIC CAPACITORS

25V-0.1μF	x	1
50V-22pF	x	1
50V-47pF	x	1
50V-100pF	x	3
50V-560pF	x	1

### ● ELECTROLYTIC CAPACITORS

16V-10μF	x	10
16V-33μF	x	1
50V-1.0μF	x	2
50V-470μF	x	1

### ● POLYPROPYLENE CAPACITORS

200V-0.22μF	x	1
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### ● POLYSTYRENE CAPACITORS

50V-6200pF	x	1
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### ● POLYESTER CAPACITORS

100V-1μF	x	1
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### ● TRANSISTORS

2SA-564A(S)	x	3
2SC-644(R)	x	1
2SC-945(L)K	x	1
(special selected)		
2SC-1583G	x	1
2SC-1685S	x	7

### ● FET

2SA-30A(O)	x	1
2SA-30A(RG)	x	2

### ● DIODES

1S-1555	x	24
1S-1685	x	4

### ● LED

GD-4-203RD	x	1
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### ● IC

KORG35	x	1
MC14007	x	1
μPC4558	x	8
μA7815	x	1
CA3140	x	1
TL081(071)	x	2
μA7915	x	1
MC14060B	x	1

### ● SEMI-FIXED RESISTORS

SR19DS 10kΩ	x	2
SR19DS 100kΩ	x	4

### ● ROTARY VARIABLE RESISTORS

EVH-5LA802B15	x	3
EVH-5LA802B14	x	3
EVH-5LA802A15	x	4
EVH-5LA802A16	x	2
EVH-5LA802B16	x	2
EVH-5LA802A26	x	3
EVC-805P18B14	x	1
RJAP20B14	x	1

### ● ROTARY SWITCH

SRM-103420P	x	2
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### ● KEY

F-E 32 key	x	1
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### ● CONNECTORS

BE4P-SHF-1	x	1
BE7P-SHF-1	x	1
BE9P-SHF-1	x	1
BS3P-SHF-1	x	1
BS4P-SHF-1	x	1

### Female Connectors

3P MS-1002	x	1
4P MS-1003	x	1
4P MS-1004	x	1
7P MS-1005	x	1
9P MS-1006	x	1
MLR-03TRC-1	x	1
MLR-03TRC-150	x	1

### \*\* ● PHONE JACKS

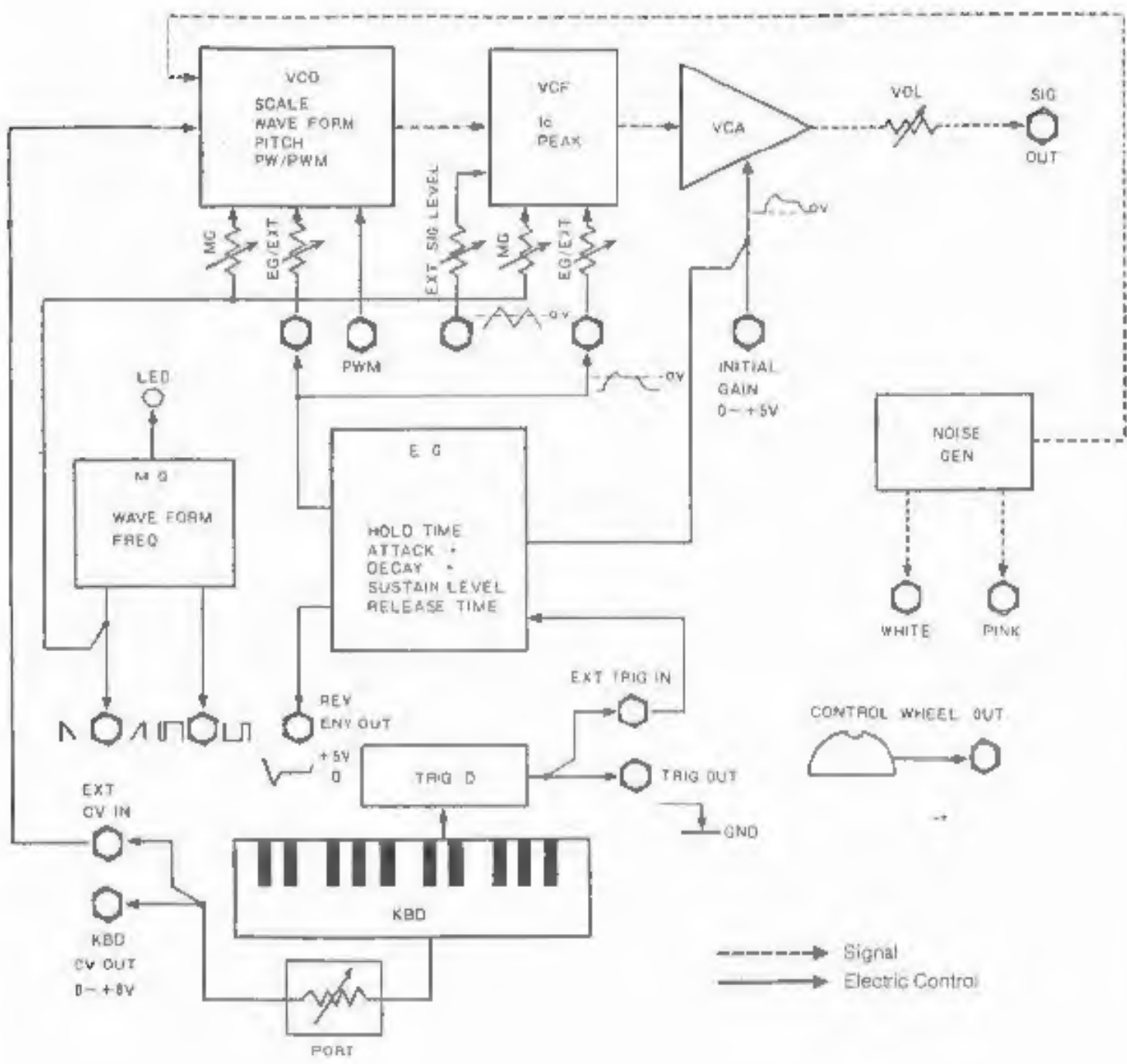
2P 5G-7501	x	11
2P 5G-7615	x	5

### ● PC BOARD

K1M-100A	x	1
K1M-125B	x	1



6. BLOCK DIAGRAM





## 7. ADJUSTMENT PROCEDURE

### 7-1 Power supply check

#### 1. Positive ripple.

Should be no more than 2mVp-p.

Set oscilloscope vertical gain at 10mV/cm and check that power supply ripple is 2mV or less.

#### 2. Negative ripple.

Same as positive, should be no more than 2mVp-p.

### 7-2 Pitch adjustment

#### 1. VCO-1.

Perform adjustment with synthesizer controls at "normal setting" (Scale=8, Waveform=□, Master Tune, Pitch, and all other knobs at "0"). See figure 1.

a. Play C-3 (high C) on the keyboard and adjust the high ① semi-fixed screw until you obtain the correct tuning as indicated by WT-10A (connected to the SIG OUT jack).

b. Play key C-1 and adjust the low ② semi-fixed screw.

c. Repeat steps a and b as many times as necessary until both are tuned to the correct pitch.

d. Check the tuning of C-1, C-2, and C-3 on the WT-10A meter to make sure pitch deviation is within  $\pm 2$  cents for each.

e. Change the scale to 32', 18', 8', and 4' and check the tuning of all four C keys to make sure that the pitch deviation of each is within  $\pm 10$  cents.

### 7-3 KBD CV adjustment

Use a 4-1/2 digit voltmeter to measure the KBD CV OUT signal.

a. Measure output voltage first when you play key C-3, then when you play key C-2. The output voltage for C-2 should be exactly half that for C-3. Adjust the KBD CV high ① semi-fixed screw as necessary so that C-2 produces half the voltage of C-3.

b. Measure C-2 and then C-1 in the same way. Adjust the KBD CV low ② semi-fixed screw as necessary so that C-2 produces exactly half the voltage of C-3.

c. Repeat steps a and b as many times as necessary until the output voltage of each of C-1, C-2, and C-3 is exactly half that of the next.

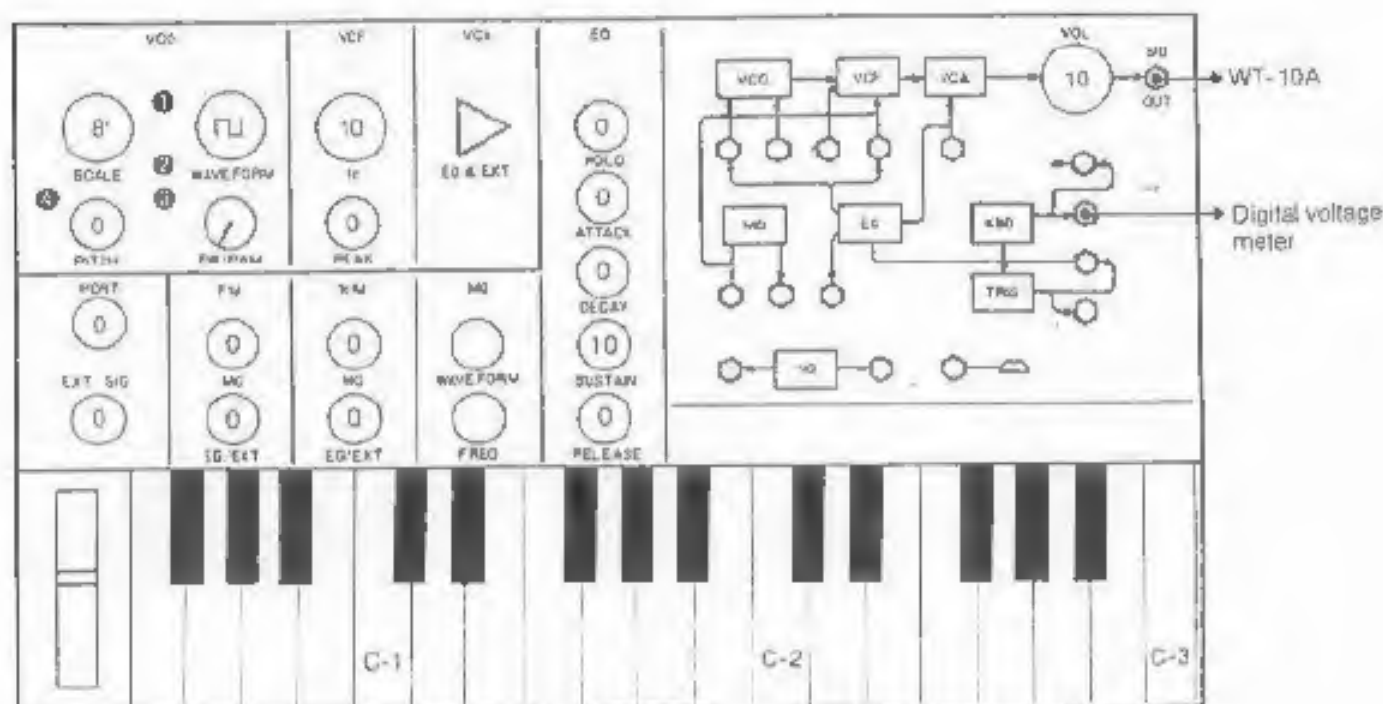


Fig. 1

#### 7-4 VCF Fc adjustment

Connect a frequency counter to the Sig out jack

##### 1. VCLPF

Refer to the settings shown in figure 2. Set the Fc knob at "5", and the LPF PEAK knob at "10". Then adjust the ① semi-fixed screw as necessary so that the LPF oscillation frequency is 500Hz.

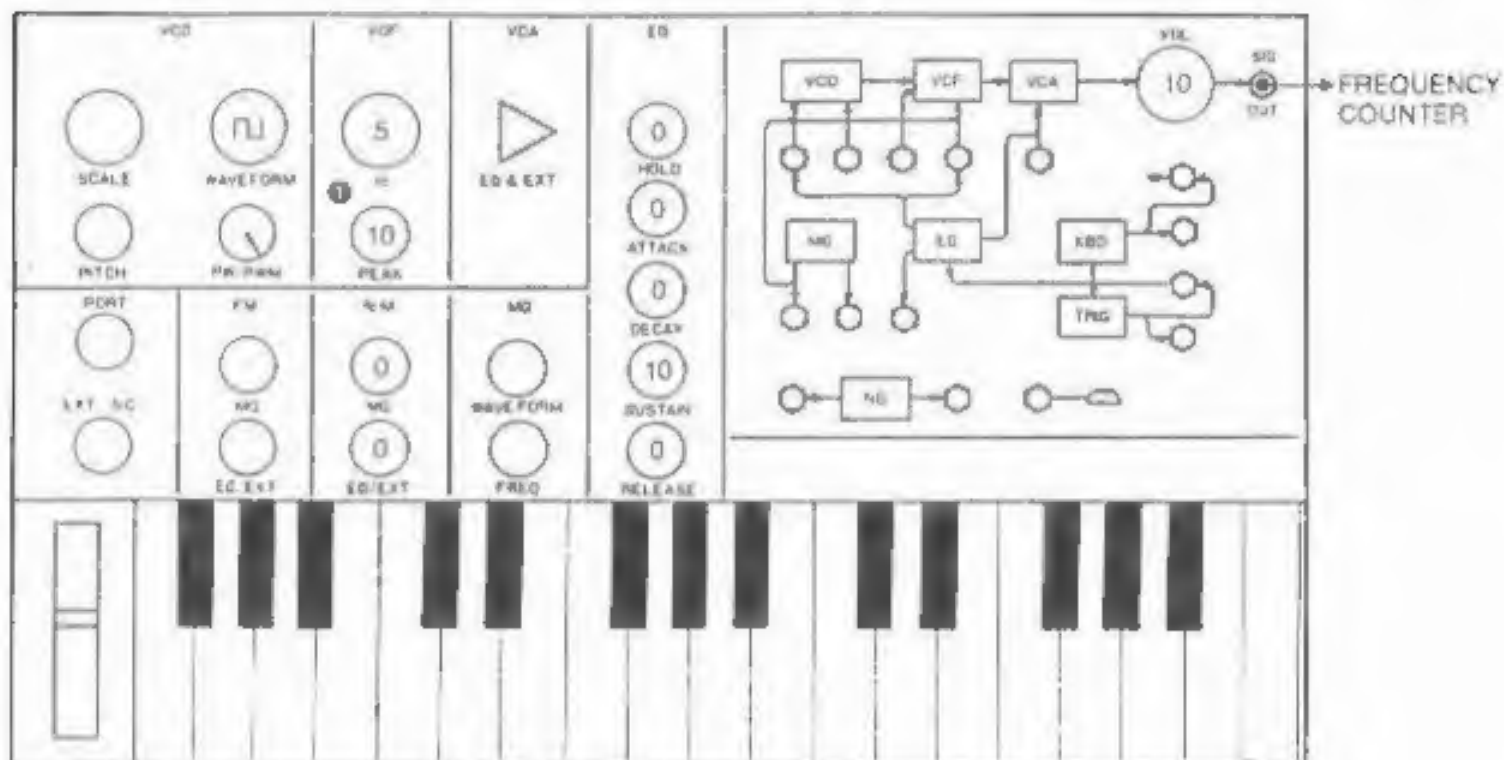


Fig. 2